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Observation of coda signals from regional and local earthquakes recorded from a downhole-uphole couple of broad-band sensors at Mt Etna.

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Seismic coda of regional and local earthquakes recorded at a couple of broad band seismometers located at the bottom of a 125 m deep borehole and up-hole at surface show interesting spectral features. We observe strong similarity between the waveforms recorded from up- and down-hole sensors at low frequency (0.1 -3 Hz) and measurable differences in the higher frequency limit. We interpret this observation assuming that at high frequency the up-hole coda is produced by body-tosurface wave scattering in the near surface. We compare the experimental results with numerical simulations done using the Monte Carlo scheme of Yoshimoto et al. (2000) carried out in the assumption of velocity and scattering coefficient which smoothly vary with depth, with the addition of a body-to-surface wave conversion for the energy particles which reach the surface. The comparison of the experimental coda envelopes with those obtained through numerical simulation allow for a quantification of the turbidity parameter at surface.

Keywords: borehole seismology, coda, seismic scattering